

The Point

A magazine for and about the people of the
**U.S. Army Medical Research
and Materiel Command**
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Celebrating 125 Years of Medical Service to Our Soldiers



Soldiers from the U.S. Army Research Institute of Environmental Medicine in Natick, Mass., celebrated the 125th anniversary of the Enlisted Medical Corps with a five-mile road march March 2. From left to right: Col. Gaston Bathalon (Commanding Officer), Sgt. Martha Alinovi, Sgt. Jermaine Ward, Spc. Hedrick Porrata, Sgt. Dennis Scofield, Spc. Robert Hollins, Staff Sgt. William Mills, Capt. John Lavoie (Company Commander), and holding the flag is Sgt. Tucker Black.

In recognition of the 125th anniversary of the establishment of the U.S. Army Medical Department Enlisted Corps, Soldiers and leadership from the U.S. Army Medical Research and Materiel Command at Fort Detrick, Md., celebrated this historic milestone with a creative and educational contest across the Command led by USAMRMC Command Sgt. Maj. Kevin B. Stuart.

The events of this competition included road marches with Soldiers in period-specific war uniforms, an essay contest on the history of the Enlisted Corps, group recitation of General Order 29, the symbolic reenlistment of troops, and the reenactment of historical events over the past 125 years.

Capturing high honors among the submissions was a collection of “Army Values” posters designed and developed by team members from the U.S. Army Medical Research Institute of Infectious Diseases. The posters highlight medical personnel depicting the various core values advocated and revered by the U.S. Army.

Stuart said, “I thank all who participated in recognizing the 125th anniversary of the AMEDD Enlisted Corps. I am

very impressed with the spry attitude and engagement of your respective units in educating others regarding this historic achievement.”

Winners of the contest were announced by Stuart March 1, with first place ending in a tie between USAMRIID and the U.S. Army Institute of Surgical Research. Second place honors were given to the 6th Medical Logistics Management Center while the U.S. Army Medical Research Institute of Chemical Defense garnered the third place award.

“General Order 29 empowered Army medics to be all we can be,” said Stuart. “Look at us now and how far we have come along over the past 125 years.”

Stuart emphatically praised the Soldiers with three simple words: Job well done!

Jeffrey Soares
USAMRMC Public Affairs



This collection of “Army Values” posters was designed and developed by winning team members from USAMRIID.

Research That Is In the Red

According to the American Red Cross, every two seconds someone in this country needs blood.



The Fort Leonard Wood Blood Donor Center staff collected 104 units of blood in only six hours from Soldiers assigned to the 4th Maneuver Enhancement Brigade at Fort Leonard Wood.

Photo courtesy of the Armed Services Blood Program

In an effort to improve the future of blood products, the Department of Defense, led by the U.S. Army Medical Research and Materiel Command, has established effective programs in the hopes of aiding both Warfighters and civilians.

Since 1970, January has been designated National Blood Donor Month by the ARC. This annual program was initiated to highlight the importance of blood donations not only in times of emergencies but also year-round. As donations typically drop off in January due to weather-related delays and travel concerns, the ARC is hoping to illustrate via its January drive that this seasonal decrease certainly does not reduce the need for blood products.

Approximately 44,000 blood donations are necessary each day to treat accident and burn victims, cancer

patients, those having surgery, new mothers, premature babies, and many others. Donating blood is considered safe, and it takes less than an hour of time commitment from the donor.

Most people know someone who has received blood and perhaps many more who have donated blood at some time. Once blood is donated by volunteers, the blood is processed in a way to produce various blood products, such as red blood cells, platelets, fresh frozen plasma, and cryoprecipitate.

Since the blood product to be used, as well as the blood type, depends on each individual patient's need for blood replacement, maintaining a robust supply remains critical for meeting the needs of the general public. Having a limited shelf-life, blood products must constantly be replenished. By reaching out to more

potential donors and explaining the need for their help, the ARC hopes that no one will be denied the health care they need on a moment's notice.

Needless to say, it goes far beyond a simple needlestick to save a life.

USAMRMC's research on Improved Blood Products falls under the broader Hemorrhage and Resuscitation Research and Development Program. The HRRDP has six major strategic efforts, and one of these focuses on developing safer and more logistically supportable blood products for transfusion. While this effort is primarily intended to help Warfighters on the battlefield, the information gained from this research will also have applications in the civilian sector.

The goals for the Improved Blood Products Strategic Effort are to develop more logistically supportable blood products for transfusion, enhance the availability of blood products on the battlefield, develop means to improve the safety of blood products used on the battlefield, and examine selected issues related to the safety and efficacy of specific blood products. Selected DoD product development and research in this area include: (1) dried plasma to reduce logistical constraints associated with frozen plasma and expand the availability of plasma in military operations, (2) cryopreserved platelets that can be stored frozen for years (DoD is also investigating other approaches to improving platelet shelf-life), (3) an improved collection and storage system to increase battlefield shelf-life and improve the metabolic quality of red blood cells, (4) a pathogen reduction system for whole blood to provide pathogen-reduced blood products, (5) clinical studies examining the effects of red cell storage age on outcomes following transfusion in

critical patients, (6) evaluation of the use of frozen versus liquid-stored red cells in a clinical trauma study, and (7) in vitro production of red blood cells that are universal donor and pathogen free.

These research efforts, along with others, will help change the way that blood products are collected, stored, processed, and ultimately transfused. However, until researchers find a way to reduce the need for blood donations, the collection of blood must continue.

Remember, although January is National Blood Donor Month, blood collection is critical throughout the year. Please consider donating blood soon, as it could help save the life of someone you know.

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USACEHR Employs Fish to Monitor Water Supplies: Aquatic Biomonitor Technology Put to Use in Major U.S. Cities

One Army-developed technology relies on nothing more than Mother Nature to help ensure that a daily and vital substance is safe and readily available. The aquatic biomonitor (available commercially as the Intelligent Aquatic Biomonitor System or iABS) uses fish and their breathing patterns to detect the presence of potentially toxic substances in water. The iABS employs a team of eight bluegill (*Lepomis macrochirus*), also known as sunfish or bream, to provide 24/7 monitoring of water supplies.

The U.S. Army Center for Environmental Health Research is tasked with developing biomonitoring technologies for the many environmental health hazards that our military members face on a day-to-day basis. Biomonitoring assesses exposure to and presence of different chemicals, natural or synthetic, in a given environment. The information collected by USACEHR enables it to provide diagnostic and prognostic tools to the military for environmental and occupational health surveillance.

The eight fish are deployed for a three-week tour of duty while eight others wait on standby to be rotated in. The fish are placed into individual “stalls” separated by a frosted glass pane. Carbon block electrodes, suspended above and below each fish, capture the electrical signals generated by the muscles in the fish as they breathe (similar to heart rate patterns on an EKG). The device monitors ventilation rate, average depth of signal, cough rate and percentage movement, as well as water quality parameters, such as water pH, temperature, conductivity, and dissolved oxygen, which are known to affect the way a fish breathes. To protect these eight worker fish, the device is also designed to withstand any nontoxic events such as power or water flow failure.

Collected data are then converted to electrical signals that are amplified, filtered, and transmitted to a laptop computer where they can be analyzed for changes in the environment. If six

of the eight fish start behaving abnormally, the device sends out an alert and begins an automated sampling process to screen the water more thoroughly for toxins. If a toxic threat is determined to be present, personnel are then called in to mitigate the issue.

The iABS is designed to be rugged and completely self-contained. Additionally, it can be set up to provide usable data in a relatively short amount of time. Laboratory tests have shown that the iABS responds within an hour to most chemicals at acutely toxic levels. Within a few hours, the iABS can produce real-time monitoring using nothing more than fish, the existing water supply, and electricity. Furthermore, the electronic components used in the device are relatively low in cost, and the automated biomonitor only alerts personnel as needed so there is no need for continuous observation. The





design of the iABS helps to keep costs down and the technology sustainable.

This novel combination of science and nature was transitioned to commercial development by a team of USACEHR scientists with support from an Army Science and Technology Objective. The Environmental Sentinel Biomonitor Team was led by USACEHR Science & Technology director Dr. William van der Schalie and a team of researchers and biologists. In December 2004, the iABS was awarded an Army Research and Development Award, and in June of 2010, van der Schalie and the team were Service to America Medals Award Finalists as a result of their work in aquatic biomonitoring.

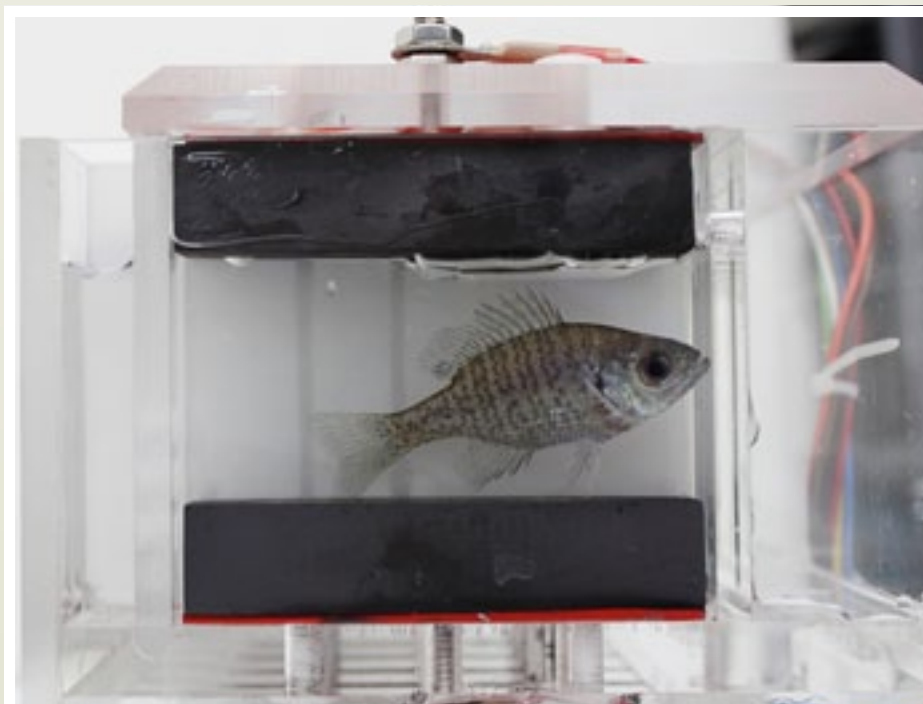
Tommy Shedd, a research biologist who worked on the iABS says, “Fish are one of the greatest model systems for the detection of contaminants in water; when you think of the potential for human chemical exposure from water, what better indicator of the potential hazard than a living organism like the fish. The fish are a first line of defense as broadband detector of potential harmful chemical hazards in water because of their integrated rapid response to abnormal contaminants in the water. The fish do not tell you what the problem is, just that there is a water problem that you should investigate further. Currently, this technology is being applied at Fort Detrick and several major municipality water treatment facilities as a continuous real-time monitor for the intentional or unintentional addition

of chemical contaminants in source and/or potable drinking water.”

The iABS is currently being used in several large municipalities across the United States to monitor water supplies. The eight small fish that are a part of this device could potentially save millions of people from using contaminated water sources. In one large city, the bluegills detected a diesel fuel spill in the water source before it reached the water supply. USACEHR is also looking into other potential tools that employ this same type of technology. One technology

uses cell monolayers to detect toxicity as changes in electrical resistance across the cell layer signal a change in the environment. This allows for a smaller and more transportable device that could be used in the field or in combat to ensure that water is safe and free of contaminants.

David Trader
research biologist, USACEHR



One of eight bluegills at work in an aquatic biomonitor chamber. Passive carbon electrodes above and below the fish monitor bioelectrical currents and digitally convert them into data for real-time monitoring.

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NICBR Symposium Highlights Research on Diagnostics and Bioforensics

Scientists from multiple agencies of the National Interagency Confederation for Biological Research gathered at the National Cancer Institute-Frederick auditorium Feb. 16 for a symposium highlighting the latest advances in diagnostic and bioforensic technologies.

More than 100 people attended the event, kicked off by Col. Bernard L. DeKoning, commander of the U.S. Army Medical Research Institute of Infectious Diseases, which sponsored the symposium as a member of the NICBR Scientific Interactions Subcommittee.

"The confederation has grown to include seven partner agencies," DeKoning commented. "I think it's clear that we are forging new territory here at Fort Detrick...it's exciting to see the benefits of this collaboration as we leverage the unique capabilities of all these agencies."

Dr. Franca Jones of the White House Office of Science and Technology Policy was the opening speaker. She highlighted some of the issues her office handles, ranging from writing policy on how research is conducted to assessing concerns that arise at the intersection of science and national security.

Keynote speaker Dr. Peyton Hobson of the U.S. Food and Drug Administration talked about his agency's role in providing development pathways for diagnostics, which are treated as medical devices by the FDA for purposes of regulatory approval.

Research toward the development of diagnostics and detection systems

involves the identification of novel biological targets, development of new or improved diagnostic assays, and critical testing and evaluation of system components, according to conference materials. A diagnostics and detection system requires assays, reagents, platforms, protocols, validation testing, and a concept of operations. The research and development path encompassing these focus areas is a complex process involving contributions from multiple independent scientific disciplines.

"It's never too early to seek FDA input," Hobson advised audience members working on new diagnostics. He commented that the agency is willing to meet with laboratory personnel, even in the early stages of assay development; in fact, this enables the FDA to better assist in developing a regulatory science plan for each product.

The rapidly growing area of bioforensics, especially microbial forensics, examines trace amounts of material from a biological terrorism event, biocrime, or natural outbreak. Bioforensic scientists answer important questions, such as what kind of biological agent was used, how it was prepared and delivered, and where and when it was made.

Afternoon sessions included Dr. Nick Bergman of the National Biodefense Analysis and Countermeasures Center, who gave a presentation on genomic-based bioforensic analysis, and colleague Dr. Steve Cendrowski, whose talk centered on detection and biological characterization of ricin in bioforensic samples.

Other speakers throughout the day-long event included scientists from the Naval Medical Research Center, the U.S. Department of Agriculture's Agricultural Research Service, and the Defense Threat Reduction Agency, as well as National Cancer Institute, NBACC, and USAMRIID representatives.

Dr. Gene Olinger, who co-organized the symposium with USAMRIID colleague Dr. Aysegul Nalca, said he thought the event went well and provided an important forum for scientists to interact.

"The NICBR member agencies have made important contributions to the knowledge base that supports bioforensics and diagnostics and detection systems," he commented. "Moreover, we are poised to provide significant future discoveries in these critical scientific fields."

Symposia will be sponsored by the NICBR partners to provide continuing opportunities for the Fort Detrick scientific community to interact, exchange information on the research being done by each of the partners, and share technology and capabilities. Next on the horizon is the NICBR Forum on Commercial Biostabilization, scheduled for March 29 at the NCI-Frederick auditorium (building 549); for more information, refer to the following web link: <http://web.ncifcrf.gov/events/Biostabilization/default.asp>.

*Caree Vander Linden
USAMRIID Public Affairs*



USAMRIID Poster Takes Top Honors at DTRA Conference



Dr. Les Dupuy (C) accepts his award, flanked by Tom McMahon (L), CEO, Calspan University of Buffalo Research Center and Dr. Alan Rudolph (R), Director, Chemical and Biological Technologies Directorate, Research and Development Enterprise, Defense Threat Reduction Agency.

USAMRIID received one of three top poster awards at the 2011 Chemical and Biological Defense Science and Technology Conference sponsored by the Defense Threat Reduction Agency held in Las Vegas, Nev., in November.

Dr. Les Dupuy, a contract principal investigator in the institute's Virology Division, and colleagues at EpiVax, Inc., of Providence, R.I., described a promising avenue for vaccine development using immunoinformatics—a technique that uses computerized analysis of biological data to tackle a problem related to the human immune system.

In this case, the “problem” is three related viral subtypes—Venezuelan, Eastern, and Western equine encephalitis viruses (VEEV, EEEV, and WEEV, respectively). All are categorized as Class B biological threat agents due to their ability to cause disease in humans as well as their potential ease of production, stability, and infectivity by the aerosol route. Dupuy's work could pave the way for

development of a broadly protective vaccine against all three viruses.

Currently, a live attenuated vaccine for VEEV (made with a weakened form of the virus) is available for limited use as an Investigational New Drug but is not well tolerated by many recipients. Other investigational vaccines for VEEV, EEEV, and WEEV, made with formalin to inactivate the virus, are less effective in producing an immune response. Development of next-generation vaccines to protect against these infections is, therefore, a high priority.

Dupuy explained that when a virus invades a human host, the immune system immediately takes over and begins to try to overcome the invader. Key to the immune system is the body's ability to distinguish between its own cells, or “self” and foreign cells, or “nonself.” When the immune system encounters “nonself” cells, it immediately launches an attack. A microbe or molecule that can trigger this process is called an antigen, and

an epitope is simply the localized region on the surface of an antigen that is capable of eliciting a specific immune response.

Dupuy and colleagues at USAMRIID and EpiVax had already looked at the genetic makeup of VEEV and developed DNA vaccines based on epitopes recognized by T cells—the white blood cells that play an important role in ridding the body of infection. They also had done some preliminary testing of these vaccines in mice, which demonstrated the potential of this approach.

Using a prediction algorithm developed by EpiVax, the epitopes that were most likely to elicit an immune response in humans were identified in the structural proteins from 140 different strains of VEEV, EEEV, and WEEV. Essentially, the technique could allow scientists to whittle down the genetic sequence to only the “pieces” that are needed to provide protection.

“We believe the combination of multiple T cell epitopes from VEEV, EEEV, and WEEV will result in a highly effective vaccine that could protect against infection from all three viral subtypes,” Dupuy commented. The team's next step is to test the efficacy of this vaccine candidate in mouse models of infection.

This pilot project was funded through a Translational Immunology Research and Accelerated Development grant to the University of Rhode Island from the National Institute of Allergy and Infectious Diseases.

Caree Vander Linden
USAMRIID Public Affairs

Army North Vibrant Response Assignment



Participants of the USANORTH VR 12 training exercise in Edinburgh, Ind. Left to right: Joe Osborne (USANORTH), CW5 Bill Keith (USANORTH), Rhonda Vincent, Andrew Marks, and Mary Proffitt.

Looking back on 2011, it was a year of many Army medical advancements in areas such as vaccine trials, prosthetics/robotics, and information technology, just to name a few, but continued improvement in Army readiness has been realized as well.

In August 2011, the U.S. Army North Vibrant Response 12 Developmental Assignment, a U.S. Northern Command field training assignment, rehearsed the nation's tiered response capabilities for any chemical, biological, radiological, or nuclear incident. The event took place in Edinburgh, Ind. at the Atterbury-Muscatahuck Complex Aug. 13–30. During this particular exercise, local, state, and federal disaster responders rehearsed response procedures to an escalating disaster after a simulated 10 kiloton

nuclear detonation in downtown Cincinnati.

The intended focus of Vibrant Response 12 is to train and confirm readiness of CBRN Enterprise Forces on domestic CBRN Consequence Management tasks through simulated theater opening and sustainment operations in a constructive and realistic live field environment. These biannual exercises, from start to finish, are incredibly challenging, involving exceptionally realistic training in an effort to increase overall preparedness for the unknown.

More than 75 safety professionals have applied to participate in the past four VR exercises, with only a total of 12 applicants, four per exercise, being selected. This year, U.S. Army

Medical Research and Materiel Command and Fort Detrick safety and occupational health specialist Mary Proffitt was selected. Proffitt came to USAMRMC three years ago as a safety intern, and in the span of three short years she has come to be an integral member of the USAMRMC Surety, Safety, and Environment Staff.

What does it take to be selected for such an exercise?

“The Safety Director, USANORTH, selects four participants from across the Army Career Program 12, which includes health physicists, industrial hygienists, safety and occupational health specialists and technicians, etc.,” explained Proffitt. “ARNORTH tries to form a team of CP-12 professionals from a variety of backgrounds, career levels, and specialties so that we can benefit from cross-training opportunities and the exercise can benefit from a broad range of subject matter expertise.”

“As a safety and occupational health specialist with a strong scholastic background in the sciences, I was a unique addition to the selectees,” said Proffitt.

Her background in radiation safety and her love of field work made her a prime candidate for the assignment.

Proffitt's supervisor Clifford Wendel, director of the Surety, Safety, and Environmental Office, described her as “an excellent example of the quality of our civilian workforce we have within the Command.”

In fact, Wendel was the one who suggested the ARNORTH exercise to



Proffitt, feeling she would be perfect for the assignment.

“Ms. Proffitt was chosen because she is one of the small, but growing number, of Army safety professionals within Career Program 12 that have completed the requirements and been awarded the Army Safety Certification. Mary has a strong commitment to providing the units within MRMC the best safety assistance possible and is extremely dedicated to both MRMC and the Army.”

The exercise

Once the final four selections were made, participants began their online training, completing both DSCA and Federal Emergency Management Agency courses in an effort to familiarize themselves with the National Response Framework called the National Incident Management System and Disaster Response. Participants then headed to Indiana to begin individual preparation before reaching their final destination of Camp Atterbury, Muscatatuck Urban Training Complex, where each was assigned a wide range of safety and occupational health management responsibilities.

“My involvement was twofold in regard to safety,” said Proffitt. “First, I was there to ensure the exercise was conducted in a manner that would not create unnecessary risk to exercise participants and observers, as well as the hundreds of locals hired to play the role of displaced civilians,” Proffitt continued, “and we had to ensure their safety.”

Safety of the participants involved in Vibrant Response 12 was crucial. The Muscatatuck Urban Training Complex was transformed into a mock disaster set, packed with more than 7,000 individuals, and included

all the “bells and whistles” one could imagine. The set simulated smoke billowing from burning rubble, cars and partially collapsed buildings, as well as strategically placed manikins simulating casualties and role actors to play the part of the displaced, injured, and confused citizenry. With such a complex set and realistic dangers being simulated, safety personnel were imperative to keeping the exercise moving smoothly without injury.

“My secondary role was to observe and provide comments on the safety considerations of the planned response itself,” said Proffitt. “For instance, if radiation contamination is present, what control measures do we take to protect the responders? Will we actively monitor environmental radiation levels and responder doses? What personal protective equipment is most appropriate?”

The VR exercise encompassed a myriad of tasks, including medical care and evacuation; communications set up; route clearing; mortuary affairs; aerial imagery; testing for CBRN elements; decontamination; shelter for displaced civilians; food, water, and medical supplies for displaced civilians; evidence collection; law enforcement assistance; and much more.

You may be asking yourself, “Is such an elaborate exercise even worth the time and effort?” Short answer, yes, it is.

“This exercise is extremely important because it trains the designated responders to work together toward a common goal and speak a universal language. This is an extremely difficult task considering the scale (7,000+ responders) of the operation and the variety of agencies and state/federal government coordination necessary to complete the mission,” said Proffitt.

“It is imperative that bureaucratic processes, common to government operations, do not impede the ability to respond to emergency events in a way that will save the most human lives and provide support for affected towns, cities, states to recuperate losses and get back to business as usual.”

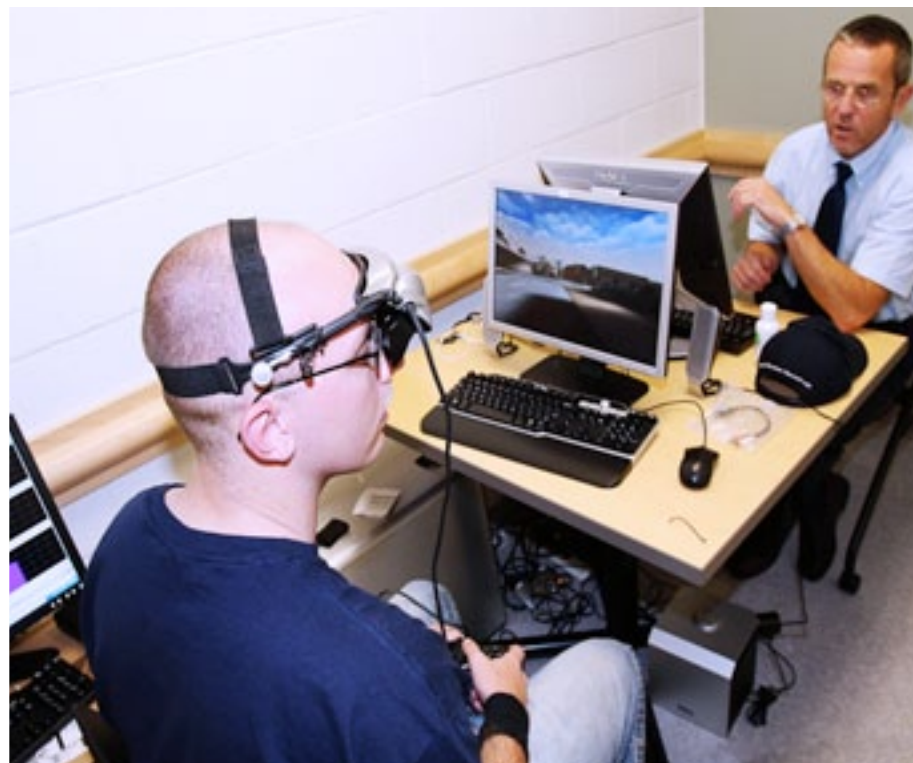
Proffitt continued, “I was both amazed and horrified by our ability to respond to such an event. I am happy to see a proactive approach to emergency preparedness, and I am glad the Army has decided to invest in much needed exercises such as this one.”

In regard to her own professional development resulting from this exercise, Proffitt could not be more satisfied.

“I have a much greater understanding of the application of safety principles and standards, and I finally had a chance to get my hands dirty. Now, while conducting safety training, I can refer to my own experience rather than a regulation or manual,” Proffitt said.

Melissa Miller
USAMRMC Public Affairs

Controlling Post-Traumatic Stress Could Be as Close as a Game on a Cell Phone: New Technology Incorporates Biofeedback into a Game to Help Soldiers Train Themselves to Combat the Symptoms of PTS



Through a DoD grant, Dr. Carmen Russoniello of East Carolina University is working toward a portable biofeedback training program that could prevent or reduce post-traumatic stress symptoms.

Photo courtesy of Carmen Russoniello

What if Soldiers could train themselves to control the physical reactions that often mark post-traumatic stress—the racing heart, rapid breathing, and overtuned responses that make it difficult to focus on the task at hand? What if that physical control could make them feel better all around, or perhaps even help prevent PTS in the first place?

And what if Soldiers could undertake this training anytime, anywhere,

through a popular game incorporated with a physical feedback system on a cell phone?

These possibilities are closer to reality than one may think thanks to the efforts of a Vietnam veteran who is now a researcher at East Carolina University in Greenville, N.C.

Dr. Carmen Russoniello's work is partially supported through Operation Re-entry North Carolina, a new ECU program that received initial funding

in September 2011 from the U.S. Army Medical Research and Materiel Command's Telemedicine and Advanced Technology Research Center. This military and civilian partnership coordinates innovative research to address the rehabilitation and civilian readiness concerns of service personnel, veterans, and their families.

Since 2008, Russoniello has been working with Marines from the Wounded Warrior Battalion East at Camp Lejeune, N.C. He is developing biofeedback training that allows wounded Soldiers to recognize and control the symptoms of PTS and brain injury. In biofeedback, real-time physiological functions, such as heart rate, breathing, brainwaves, and muscle tone, are recorded and visualized to enable an individual to learn to control these functions.

Russoniello's program uses several biofeedback techniques. Marines receive neurofeedback to visualize and train their brain activity into a more focused state. And they learn to lower their heart rate through a regimented breathing process. This is combined with counseling in a graded-exposure technique that introduces greater stressors as the individual gains more control over his or her reactions.

A unique aspect of the program is that Russoniello's team has worked with Seattle-based PopCap Games to incorporate the biofeedback training into a video game.



“We had to consider how we could keep a person interested in regulating his or her heart rate,” said Russoniello. “In the game, you get health points as your heart rate becomes more in sync with your breathing.”

PopCap is the maker of popular mobile and social games such as Bejeweled®. A recent study published by Russoniello has linked playing Bejeweled to decreased stress and reduced depression.

Dr. Brenda Bart-Knauer coordinates Camp Lejeune projects for TATRC. She is heartened by initial results that indicate Russoniello’s approach is very effective in ameliorating symptoms of PTS.

“This approach puts the Soldier back in control,” she said. “He or she can learn to regulate and recalibrate that heightened state of functioning that may have been needed in a combat zone, but in fact makes it very difficult to relax and deal with everyday stress.”

Russoniello recently teamed with Biocom Technologies and began two pilot projects with the new TATRC funding. TATRC sees these as important steps toward the goals of validating the results and making the program portable so service members could have access to a potentially life-changing treatment on their cell phones.

Both projects are expected to be completed in 2012.

The first is a formal study to prove that the technique of controlling heart rate variability combined with neurofeedback is effective in reducing symptoms of PTS. In a four-week graded-exposure program, Russoniello will move the volunteers from training with stressful conversation to pictures to a virtual reality Iraq combat scenario.

The second project supports work to build and test a cell phone system that records heart rate information and sends it immediately to a secure cloud server. The project incorporates a new technology developed in 2011 that turns the flash camera of a cell phone into a heart rate sensor. Place a finger on the back of the camera, and that person’s pulse rate shows in the viewfinder on the front of the phone.

With the server connection, a medic in the field can send data to remote health care staff to assess whether an injured Soldier is in shock or going into cardiac arrest. The technology is also key in Russoniello’s next goal. He is working with PopCap to incorporate biofeedback training into the game Bejeweled on a cell phone platform.

Russoniello has applied for a third Department of Defense grant to fund this work and test it in the field. The project would include training one company in a battalion using the cell phone game before and during deployment, and simultaneously fol-

lowing a second comparison company to determine whether or not the training can prevent PTS. He hopes to have the adapted game and funding in place to begin the study sometime during 2012.

“Evidence indicates that controlling the physical response can impact one’s mental experience of stress,” says Russoniello. “This probably goes back to our deepest survival instincts. When a person has an internal feeling of safety and physical harmony, rather than turmoil, the cognitive part follows along.”

He adds, “It’s exciting that we may have a game that could make an impact on PTS with little to no side effects. I would love to see this proven and in use for our service members within the next three years.”

For more information, visit www.ecu.edu/biofeedback or www.tatrc.org.

*Barb Ruppert
TATRC science and
technology writer*



The team in Russoniello’s lab is also developing and testing a telemedicine device incorporated into a cell phone that can deliver heart rate data to remote health care staff for assessment.

Photo courtesy of Carmen Russoniello



Study Proves TXA Should Be Implemented into Military Clinical Practice

Hemorrhage is the leading cause of death in civilian and military trauma.

Fortunately, there is hope.

Through the Joint Theater Trauma System, which is an organized approach to providing improved trauma care across the continuum of the Levels of Care to trauma patients, especially in the battlefield environment, and after years of observations, tranexamic acid, or TXA, was recognized.

There was level 1 evidence in the CRASH-2 trial for the use of TXA including a purported survival benefit in civilian trauma patients. However, the existing study performed on TXA was in a civilian population; the study took place in third-world countries where modern-day transfusion techniques were not applied nor did patients receive any units of blood.

“This study prompted a spirited debate,” said Col. Todd Rasmussen, deputy commander of the U.S. Army Institute of Surgical Research and chief of the San Antonio Military Vascular Surgery Service.

Military surgeons, civilian surgeons, and academia met for months at dif-

ferent conferences, and the consensus was to not use TXA.

“Even though we as the United States Combat Casualty Care system decided not to use TXA, there was evidence that it was working and that it was safe. There was some discomfort. We were torn between using it and not using it. That’s what happens in science. We needed to see whether or not TXA was clearly applicable. So, we decided to do a retrospective cohort study,” said Rasmussen. “The British were using TXA and were interested in seeing how well it was working, and we in the U.S. had an interest because at Camp Bastion in Helmond Province, Afghanistan, the British were treating select U.S. troops with TXA as part of their resuscitation strategy.”

“The benefit of the retrospective cohort study is that it targets the exact population that wasn’t available in the CRASH-2 trial study,” said Dr. Kenji Inaba, assistant professor of Surgery and medical director of the Surgical ICU Division of Trauma & Critical

Care at the University of Southern California.

The retrospective cohort study was performed on patients having been treated at the U.K.’s Camp Bastion. Using the Joint Theater Trauma Registries of the two countries, two consecutive years of clinical data were reviewed, focusing on patients receiving at least one unit of blood within 24 hours of a combat-related injury. This included information on U.S. troops having been treated at the facility said Rasmussen.

The study compared several end points, including survival between patients who received TXA and those who did not. Out of approximately 1,000 patients, nearly 300 were U.S. troops.

“This study was the first international collaboration of its kind and required the U.S. IRB [institutional review board] approval as well as approval from the U.K.’s Ministry of Defense Research Ethics Council. We sent select U.S. researchers to the U.K. Joint Medical Command Research Pillar to work with U.K. researchers using their trauma registry. Subsequently, the U.K. sent surgical researchers to the U.S.

Army Institute of Surgical Research to work with the U.S. Joint Theater Trauma Registry,” said Rasmussen.

The result of this groundbreaking international military collaboration is a study referred to as the MATTERS, or the Military Application of Tranexamic Acid in Trauma Resuscitation Study. This study concludes that the use of TXA as part of a blood component resuscitation following wartime injury provides a survival advantage that is most notable in patients receiving larger amounts of blood. Preliminary results from the MATTERS study show few if any serious complications identified with the use of TXA although Rasmussen was quick to add that “prospective study of the use of TXA is needed to more fully define its safety profile.”

“Retrospective study methodology is by no means perfect, and further investigation is and will be performed to determine the extent of effectiveness of TXA. However, this study was implemented in a fairly expeditious manner, and as a result, the effects of saving lives can start now rather than years later,” said Rasmussen.

“Any product that is demonstrated to decrease bleeding with improved outcomes at an acceptable cost and with an acceptable risk profile will potentially benefit injured patients—both military and civilian,” said Inaba.

[Editor's Note: The Clinical Practical Guidelines of the United States' Joint Theater Trauma System has been updated based on the findings of the MATTERS study to support the use of TXA in theater.]

Tiffany Holloway
USAMRMC Public Affairs



NATO RTO RTG-184 working group meeting attendees.

Photo by Bennett Rock, USAARL

USAARL Hosts International Meeting

The U.S. Army Aeromedical Research Laboratory at Fort Rucker, Ala., hosted the North Atlantic Treaty Organization, Research and Technology Organization Task Group, NATO RTO RTG-184, “Safe Ride Standards for Unmanned Aerial Systems-Casualty Evacuation” meeting Jan. 30 through Feb. 3. At the invitation of Col. Dana Renta, USAARL commander, and John Ramiccio, chief of USAARL’s Flight Systems Branch and RTG member, military officers and dignitaries from organizations representing the U.S. Army, Navy, Air Force, and Air Force Special Operations Command, British Royal Air Force, and Israeli Defense Force participated in the meeting.

Since the 1920s, aeromedical evacuation has been conducted on board fixed- and rotary-wing aircraft. The gravitational forces experienced by injured patients on board the aircraft are within human tolerance limits because the forces are controlled by onboard pilots. UAS can generate g-forces far greater than traditional medical evacuation aircraft. For UAS to be used for far-forward medical evacuation, safe ride standards for injured patients are critical to UAS developers

who need to ensure their airframes are suitable for medical evacuation.

The NATO RTG, made up of aviation, medical transport, and UAS experts, began researching the development and flight characteristics of UAS in 2009. Through the years, the group researched control mechanisms of UAS, the potential uses of UAS for medical evacuation, and in-flight medical monitoring. During this most recent meeting, however, the group evaluated the research underlying the NATO standards that it will publish. The standards will be used by UAS developers to ensure that the artificial intelligence programs used to control UAS are able to support the use of these airframes for medical evacuation.

Brig. Gen. (Retired) Erich Roedig, MD, CFS, former surgeon general of the German Air Force and chairman of the NATO working group commented, “I hope this meeting will bring us a step forward in our work so that in a few months from now we will have reached our goal of developing documents for safe ride standards for wounded warriors being transported on board UAS.”

Catherine Davis, USAARL



Through USAMRMC Vision Portfolio, Injured Soldiers Are Able to See Again

February was Low Vision Awareness Month. This campaign was started to raise awareness for macular degeneration and other vision problems. Low vision affects a person's entire life, interfering with the ability to perform daily activities. The term low vision means partial sight or visual impairment that is not correctable with contact lenses or eyeglasses. We often take for granted that we have our sight or that we can smell, touch, hear, and taste. Tragedy can strike at any time, even more so when on the battlefield.

"That's why the U.S. Army Medical Research and Materiel Command has decided to aid injured Soldiers," said Col. Karl Friedl, director of the Telemedicine and Advanced Technology Research Center.

Under its vision portfolio, TATRC funded and investigated technologies for noninvasive vision sensory substitution and augmentation to allow wounded warriors to return to more normal social interactions. These efforts range from being able to navigate without a cane to having improved visual acuity throughout a range of injuries.

Over 18 months, the Florida Institute for Human and Machine Cognition

developed a prototype called the Anthro-Centric Multisensory Interface for Vision Augmentation/Substitution system. This system has the potential to give the sense of vision to include peripheral vision. This information may help to improve a blind individual's situational awareness, according to Robert C. Read, program manager for Vision, Diabetes, and Pain Research at TATRC.

One of the first experiments performed in the realm of sensory substitution involved pilots flying and executing aerobatics while blindfolded. The pilots were getting all of their veridical information from an early version of the tactile situation awareness system, or TSAS (a U.S. Army Aeromedical Research Laboratory, a subcommand of USAMRMC, development). With TSAS, these pilots could still successfully perform maneuvers in the air without visual input.

"They improved the user control interfaces and developed a method to allow tactual understanding of color. The final portion of this grant will focus on human research participant testing and evaluation, data analysis, drafting a publication detailing the results, and development of the final

ACMI-VAS prototype design specification document," said Dr. Anil Raj, Institute for Human and Machine Cognition.

The main systems used for these human-centered interfaces are auditory and tactile displays. One of the displays includes a TSAS. The other two tactical displays are the Videotact (ForeThought Development, LLC, Blue Mounds, Wis.), and BrainPort® (Wicab, Inc., Middleton, Wis.) electro tactile tongue displays. The purpose of these technologies is to attempt to help vision and balance function.

Sounds are displayed tactually on the tongue or abdomen to allow individuals to recognize human speech. Speech recognition technology is used to increase saliency of human speech components against the background of other sounds to recognize words that would have been spoken. In addition to augmenting auditory capabilities, Raj and his team are working to augment visual capabilities by methods such as incorporating three-dimensional models of the environment in real time.

The noninvasive nature of the ACMI approach ensures that wounded warriors could benefit from future



TSAS implementation with 24 vibrotactile transducers in a tactile torso interface.



A service member uses his prosthetic eyes to control a tracking reticle on the screen with tactile (tongue based) display of area displayed inside the reticle (near the user's finger).

upgrades as technologies improve without risk of further surgeries or infection associated with implantable devices. The proposed complementary interface displays can be tailored to suit the needs of an individual.

Raj said, “For example, an injury that spared the peripheral vision may only require the higher resolution displays whereas a condition like hemianopsia might only require a low-resolution spatial awareness component.”

This proposed technology development will result in a single integrated

system prototype capable of providing an alternative mechanism for visual sensing of high-resolution central vision, low-resolution peripheral vision, and stabilization of the imagery despite perturbations of the head.

“Even profoundly blind individuals may benefit from the modularity of the system as they could choose to use specific displays for any given activity,” said Read.

Raj added, the use of the ACMI software agent framework ensures that integration of improvements in any

of the major technologies, including sensing devices like a camera and interfaces (potentially even implantable ones), will occur quickly, speeding up evaluation of incremental changes and their deployment to the users.

Collaborations like this give hope and a sense of encouragement to wounded warriors who may have lost their sight to make the most of remaining vision and realize that life does go on ... with them.

*Tiffany Holloway
USAMRMC Public Affairs*

Medical Laboratory Specialist Invents a Bone Marrow Extraction Device for Use in Tissue Repair Research



Spc. Erik Eaton, a 68K (medical laboratory specialist) at USAMRICD, works with his bone marrow extraction invention device.

The complex and dynamically changing nature of battlefield injuries requires continual progress in the development of novel wound treatment technologies. In a significant advance toward expanding medical countermeasure development, Spc. Erik Eaton, a 68K (medical laboratory specialist) of the U.S. Army Medical Research Institute of Chemical Defense, has recently submitted an Invention Disclosure for a device that holds great promise in facilitating efforts to investigate the efficacy of a therapy based on a type of tissue repair cell found in adult bone marrow. The particular cell type being evaluated is referred to as the mesenchymal stem cell, or MSC. These

cells have shown the capability to mature to form new bone, skin, muscle, blood vessels, and several other cell types. Interestingly, the cells also show dramatic effects on reducing inflammation specifically at the site of tissue injury. Together, these properties make MSC therapy a promising new approach to address injuries that are challenging to treat but commonly sustained by the Warfighter.

Before this technology can be implemented for battlefield use, the safety and efficacy of MSC administration as a therapeutic must be thoroughly evaluated. Mouse models of tissue injury are frequently used to investigate

these important parameters for new drugs. However, the use of mice to study the potential benefits of biological products isolated from bone marrow has been historically difficult due to the small amount of marrow that can be obtained from each individual donor.

Previously, mouse bone marrow has been isolated for laboratory studies by flushing the marrow from the longest bones of the donor with saline solution. Using this approach, the amount of bone marrow obtained has been low and highly variable. The new device developed at USAMRICD represents a construct that holds the bone in place while the sample is spun

at a high rate of speed. The result is that a bone marrow pellet forms at the bottom of the tube-shaped device. The isolated marrow can then be collected and utilized to obtain cells for evaluation as a potential therapeutic. This new method allows for the acquisition of significant amounts of bone marrow from each mouse donor in much greater volumes than those previously reported using conventional protocols. In addition to use in the study of cellular therapies, the device could be utilized to isolate the starting material for investigations of proteins and any other biological constituent that occurs naturally in the bone marrow for evaluation of potential medical efficacy.

The use of mice in studies designed to determine if a new candidate drug will be effective in promoting wound healing holds certain important advantages. A variety of mouse strains is available to researchers that can be used to hone in on the specific mechanisms by which the drug provides benefit—information that is critical in obtaining approval by the U.S. Food and Drug Administration for the medical use of therapeutics. The breakthrough represented by the development of a marrow extraction device for use with mouse donors holds great potential for facilitating research that will result in the delivery of cutting-edge medical interventions to address the unique demands specific to the treatment of battlefield injuries.

*Timothy R. Varney, Ph.D.
primary investigator, USAMRICD*



Military Medicine and Johns Hopkins Carey Business School Team Up to Speed New Technology to Warfighters

Student teams from the Johns Hopkins University Carey Business School Global MBA program presented commercialization plans for eight military medicine projects in December 2011, marking the first such Department of Defense/university technology transfer partnership.

The military projects were all sponsored by the U.S. Army Medical Research and Materiel Command's Telemedicine and Advanced Technology Research Center. TATRC joined with Johns Hopkins' new Global MBA program in its Discovery to Market Project, or D2M, a required yearlong course in which students develop a business plan for translating a scientific discovery into a technology with commercial potential.

TATRC researchers were among several high-technology partners working with the students. TATRC projects included in the program ranged from an e-learning system for surgical skills to a wearable robotic arm to a mobile diabetes self-care system.

TATRC's director of technology transfer and commercialization,

Ron Marchessault, said he approached Hopkins about participating in the project because he felt it could be a useful part of TATRC's wider commercialization program. He and Carey Business School interim dean Dr. Phillip Phan and other staff worked out a collaboration that would aid in TATRC's goal of translating research into new products to advance the care of the nation's warfighters.

The D2M program gave the students vital experience in applying business theory to assist high-tech start-up companies in the Baltimore/Washington region. At the same time, it provided invaluable input that may help speed promising technology to market to address the health needs of service members.

"The intellectual property research and in-depth marketing analyses the students provided these scientists and small companies for free could easily have cost them hundreds of thousands of dollars," said Dr. Toby Gordon, the D2M course director. "The students were enthusiastic and brought all of the resources of Johns Hopkins to bear on their projects."

Dr. Yiming Chen, who managed the TATRC student projects, noted that the inventors were surveyed, and most were highly satisfied with the quality of the students' work.

"We were very pleased to have such rigorous, objective analyses for these projects regarding what would be needed to create a viable product and who would buy it," said Marchessault. "The D2M partnership is helpful to our efforts to apply federal research dollars where they will have the greatest benefit, and we look forward to working with the next class of students."

TATRC has an innovative Technology Transfer Program to partner federally funded research and development with private sector investment to bring new technologies to the care of the Warfighter.

Barb Ruppert
TATRC science and
technology writer

Bioelectric Bandage Incites Army Interest



The positive effects of the Procellera bioelectric bandage are said to include faster healing, greater pain control, reduced incidence of infection, and decreased scarring.

The U.S. Army Medical Research and Materiel Command has initiated steps to evaluate a new bioelectric bandage with Prosit™ technology. Procellera™, manufactured by Vomarix Inc., is a bandage dressing that creates electrical impulses. Small silver and zinc dots embedded into cloth create microcurrents in the presence of moisture. The effect is antimicrobial and provides pain reduction.

The use of silver on burns has a long history of preventing infections. The combination of silver, zinc, and moisture is purported to create pain-reducing antimicrobial microcurrents. According to company literature, the results of this bandage dressing include faster healing, greater pain

control, reduced incidence of infection, and decreased scarring.

The U.S. Food and Drug Administration has cleared the device for antimicrobial wound care, which is the primary reason for the Army's genuine interest in the product. The bandage is currently being used on hard-to-heal wounds with multiple research studies under way. Anecdotal results are promising, especially with regard to pain control. In some cases, wound pain is reported to be reduced dramatically.

The nature of the cloth conforms well to multiple surfaces of the body. Bacterial, viral, and fungal infections are anticipated to be impacted by the antimicrobial properties of the bandage

dressing, which has tremendous potential for Soldier use.

Studies are under way with Ranger units. Recently, at a Ranger road march, a considerable number of Soldiers obtained blisters and were treated with the Procellera bandage. The results were astonishing as many Soldiers reported dramatic pain relief and the ability to quickly return to the march.

The novel technology of this bandage is that it creates a healing bioelectrical pathway over the entire wound surface, enhancing the body's natural healing environment. As a broad-spectrum antimicrobial flexible dressing with electrically active currents providing pain control, the device is certainly a product with huge potential.

The public should expect to see more of this product as indications for use are expanded. Although more clinical efficacy studies are needed, this extremely lightweight, high-impact dressing is certainly one to be watched. Currently, indications for use are directed toward all full- and partial-thickness skin wounds from simple abrasions and skin tears to traumatic wounds and surgical sites. Given this, the battlefield may serve as the best proving ground in which to test this emerging medical device.

For more information, view the company's web site at <http://www.procellera.com/about/prosit>.

Dan Kennedy, product manager, Chief Acute Care Division, Program Management Office Medical Devices

Please note: The mention of commercial products in this article does not constitute endorsement by the U.S. Army.



Adenovirus Vaccine Fielding Update

The U.S. military began administering adenovirus type 4 and type 7 vaccine, live, oral to recruits in basic training over a four-week period that began the week of Oct. 24, 2011.

Since October, the manufacturer has shipped 100,800 doses of adenovirus vaccine to the nine basic training sites, and the services have administered approximately 50,000 doses of vaccine. Since January 2012, essentially all basic trainees present at the training sites have been immunized with adenovirus vaccine, said Dr. Clifford Snyder, Jr., product manager for adenovirus vaccine in the Pharmaceutical Systems Project Management Office of the U.S. Army Medical Materiel Development Activity.

According to Snyder, while several pathogens are known to cause febrile respiratory illness, years of medical research in the basic training setting have shown that if trainees are immunized with an effective flu vaccine, adenovirus type 4 has been the major pathogen associated with FRI. Thus, one can expect that administration of an effective adenovirus vaccine containing a type 4 component will lead to a marked reduction in the rate of FRI.

The published Naval Health Research Center data show a marked reduction in the FRI rate beginning in mid-November 2011. The amount of the reduction is about 75%. In addition, the number of specimens taken from FRI patients that are positive for disease-causing adenovirus type 4 has dropped to very low levels. According to Snyder, the striking reduction in the FRI rate is almost certainly attributable to the administration of adenovirus vaccine.



An Army recruit receives the adenovirus vaccine during basic training at Fort Benning Oct. 26, 2011.

Photo courtesy of Traci Vactor, health systems specialist, Military Vaccine Agency

“The results are undeniable when you look at the numbers,” said Lt. Cmdr. Carolyn Winningham, Lovell Federal Health Care Center preventive medicine officer. “The vaccine is fast, effective, and safe. At the end of the day, our job is about keeping U.S. Navy recruits healthy and in training. So for us, the adenovirus vaccine has been a huge success.”

The Lovell FHCC provides care to trainees at Naval Station Great Lakes.

Snyder put this achievement in perspective by stating, “Hundreds of people have worked hard to bring us to the point that senior leaders in the Department of Defense envisioned about 11 years ago, namely the time when military leaders no longer need to worry about the threat posed to military recruits by adenovirus types 4 and 7.”

USAMMDA Public Affairs

USAISR Soldier Accepted to Medical School



"I am continuing on the formal path to the realization of my childhood dream of being a physician," said Spc. Birk T. Greene, who has been offered and has accepted a conditional admission to the Oakland University William Beaumont School of Medicine in Rochester, Mich. "I know I will pass my background screen and plan on attending medical school in August." According to Greene, he is still expecting to hear from three other medical schools that he interviewed with, one of them the Uniformed Ser-

vices University of the Health Sciences in Bethesda, Md.

"If I am offered admission to USUHS, then I will be going there," said Greene. "I have also applied for the Health Professions Scholarship Program. There are still a lot of unanswered questions and everything is still up in the air. The only certain thing is that if the Army lets me go, I know I will be going to medical school somewhere next year."

Greene's first option would be to attend USUHS, which is the U.S. federal government-run health science university that prepares graduates for service in

the military medical corps. If not offered admission at USUHS, then Greene would prefer to attend medical school under the HPSP. This program offers prospective military physicians, dentists, nurse practitioners, optometrists, psychologists, physician assistants, pharmacists, and veterinarians a paid medical education in exchange for service as a commissioned medical department officer.

"Where I will actually go is up in the air, but I know that at least I have one

school that has decided to give me a chance," he said.

Greene hopes that his drive and determination to fulfill his childhood dream will inspire others to realize their goals and to set an example for his children about hard work, discipline, perseverance, and excellence.

"I want to be able to provide the proper guidance and mentorship to empower them to chase their dreams," said Greene. "Most of all, I want to reach those individuals most like me. Those who want to pursue a career in medicine but are not truly empowered to do so."

Greene has been in the Army for four years and has been working at the U.S. Army Institute of Surgical Research as a laboratory technician in the Damage Control Resuscitation Division of the Combat Casualty Care Research Directorate for the past two years and said that he is ready for the challenges of medical school.

"There is a sense of relief because I have been offered admission somewhere, but the anxiety continues as I still have issues that need to be clarified," he said. "I don't really think that I will know true relief because I will fret over whether I can go or not and then jump right into working hard enough to succeed. I feel confident because I have proven to people that I am good enough to have a chance at becoming a physician."

*Steven Galvan
USAISR Public Affairs*



USAMRMC Intern Spotlight

Anna Moravusova, U.S. Army Medical Research Institute of Infectious Diseases

Anna Moravusova is a Johns Hopkins fellow, working in the Division of Integrated Toxicology under principal investigator, Dr. Rekha Panchal.

How long have you been interning with Dr. Rekha Panchal?

I began my fellowship in September 2010 at the same time when I began my studies at Johns Hopkins University, pursuing a master's degree in biotechnology with a concentration in biodefense.

What do you think of USAMRIID after being here for 18 months?

Before I started my fellowship, I only knew about USAMRIID from Richard Preston's book "The Hot Zone" and the movie "Outbreak." When I got the opportunity to learn from this one-of-a-kind institute I felt very honored. I have met brilliant scientists and very helpful mentors. Learning has always played an important role in my life, and I feel grateful to USAMRIID and those who helped me gain expertise in the research field here at USAMRIID.

How did you get interested in biotechnology?

I worked in a clinical microbiology laboratory as a medical technologist before I came to USAMRIID. I enjoyed working with bacteria and the laboratory work itself. I wanted to expand my knowledge

and learn about laboratory work in the research field. I was awarded this fellowship position at USAMRIID through Johns Hopkins University. I realized that the world has significantly changed after September 11, 2001, and I could benefit society with expertise in the biodefense field.

What's the best thing about working here?

I am very impressed by the dedicated work of scientists who work here, and I feel very proud to be a part of the community and learn from the best experts and teachers. During my period here at USAMRIID and Johns Hopkins University, I learned a variety of skills that I will find helpful in my future endeavors.

What do you hope to do after graduation?

During my studies, I have repeatedly come across the fact of the important roles clinicians play in recognizing and treating patients suffering from unusual infections, for example, anthrax letters-associated disease. After completing my fellowship at USAMRIID in May 2012, I am moving on to pursue another master's degree and become a physician assistant. I am hoping to apply my knowledge of the biodefense field in patient care and educate others of the importance of recognition of the early signs and symptoms of these unusual diseases in the biodefense field.

Are you interested in a research or military career?

As of right now, I am keeping my options open. I have considered a military career as a future physician assistant but have not made any arrangements. I would be interested in participating in clinical research if the opportunity arose once I become a physician assistant in the next three years.

Are there any final thoughts you would like to share?

The experience at both USAMRIID and Johns Hopkins University has been very enriching, and I feel very grateful for this opportunity. I will carry the knowledge and skills I have gained at USAMRIID everywhere I go. I hope to never come across patients as victims of intentional biological attacks, but if I do, I will be very well prepared and will be able to carry out the correct actions in timely manner and hopefully save many lives.

New Truncal Tourniquet Ready for Battlefield Use

Saving the lives of combat wounded is one of the main objectives at the U.S. Army Institute of Surgical Research at Fort Sam Houston, Texas. Research on pre-hospital care devices like the tourniquet has proven to save lives on the battlefield from a wound to the arms or legs, which was once the most common cause of preventable death.

Now, after almost two years of research on a device to prevent the most common cause of preventable death in the battlefield, the junctional tourniquet is ready for battlefield use.

“Exsanguination, or bleeding to death, from the body is now the most common cause of preventable death to wounded warriors on the battlefield,” said Dr. John F. Kragh, an orthopedic surgeon and researcher at USAISR. “Groin hemorrhage is the most common type of junctional bleeding where regular tourniquets cannot work.”

Research on the effectiveness and type of battlefield truncal tourniquet began in 2009 after the Committee on Tactical Combat Casualty Care made it a research priority. Shortly after, the Combat Casualty Care Research Program of the U.S. Army Medical Research and Materiel Command and USAISR headquarters requested candidate devices for the research.

The Combat Ready Clamp, or CRoC, which has been approved by the U.S. Food and Drug Administration, is manufactured by Combat Medical Systems in Fayetteville, N.C. This clamp was selected from a handful of junctional tourniquet prototypes from those submitted after the request for candidate devices.

“The CRoC is a vice-like tourniquet that can be placed over the groin and lower abdomen,” said Kragh. “A pressure ball is screwed down to press on the artery and to stop the bleeding.”

USAISR is committed to optimizing combat casualty care by focusing on providing requirement-driven combat casualty care medical solutions

and products for injured Soldiers, from self-aid through definitive care, across the full spectrum of military operations.

*Steven Galvan
USAISR Public Affairs*



Dr. John F. Kragh, an orthopedic surgeon and researcher at USAISR, demonstrates how to apply the Combat Ready Clamp that has been approved for battlefield use.

Photos by Steven Galvan



USAISR Soldier Named MEDCOM Equal Opportunity Leader of the Year

Sgt. 1st Class Jeffery K. Jenkins of the U.S. Army Institute of Surgical Research was selected as the 2011 Equal Opportunity Leader of the Year for the U.S. Army Medical Command.

Jenkins, the USAISR Research Directorate non-commissioned officer in charge, said that this award will now give him the opportunity to attend the Army's Equal Opportunity Advisor course and obtain a special assignment as an EOA.

"It also gives me greater responsibilities in the equal opportunity world, to have a great impact on a greater number of Soldiers," he said. "It also enables me to teach and train the force on the fair, just, and equal way to work and live."

In a memorandum signed on January 6, MEDCOM commanding general and Army surgeon general Lt. Gen. Patricia D. Horoho stated that Jenkins promotes the tenets of civil/human rights and equal opportunity within the workplace and throughout the community.

"His inclusive engagement of the community, embracing all backgrounds, cultures, and ethnicities,

has greatly helped our organization and the United States Army to appreciate and value our rich diversity, and his example serves as an inspiration to all Soldiers with the MEDCOM," Horoho wrote.

"He has brought great honor to our organization," said Col. (Dr.) Lorne H. Blackbourne, USAISR commander.

"Equal opportunity is our bridge to eliminate discrimination. Our application and understanding of equal opportunity will open our minds to a world beyond our own lives," said Jenkins. "So equal opportunity guarantees a balanced distribution to all for all, allowing access to the best that life has to offer. Equal opportunity is an entitlement as well as a right, and I want to educate Soldiers, civilians, and contractors about the importance of how all deserve that right. Equal op-



Sgt. 1st Class Jeffery K. Jenkins, USAISR

portunity should not have to be earned through works, statistics, or quotas, but instead, it should be the way life is conducted—fair, just, and equal."

Steven Galvan
USAISR Public Affairs

USAMMA

January

Meritorious Service Medal

Chief Warrant Officer 2 Marvin B. Baker

Maj. Jason Harrington

Promotion

January

Lt. Col. Jonathan Arthur Edwards

USARIEM

January

Meritorious Service Medal

Staff Sgt. Mark A. Kryskow

Promotion

January

Sgt. Jermaine Allen Ward

USAMMCE

October 2011

Legion of Merit

Master Sgt. Terri L. Dickerson

January

Meritorious Service Medal

Maj. Michael Ronn

USAMMDA

January

Meritorious Service Medal

Lt. Col. Brian D. Moore

USAMRICD

Meritorious Service Medal

Capt. Robert Brodnick
Sgt. 1st Class John Evans

Army Commendation Medal

Sgt. Marco Acevedo
Capt. Robert Brodnick
Sgt. Nydia Wickenden

Army Achievement Medal

Spc. Sharifq Baksh
Maj. Venee Morthole
Capt. Sean Palmer
Sgt. Zachary Phillips
Spc. Cheryl Schenck
Spc. Francisco Vaca

Good Conduct Medal

Spc. Luis Cains
Spc. Cheryl Schenck

Certificate of Achievement

Alfreda Dunn
Staff Sgt. Vicki French
Spc. Melissa Thomas

Commander's Award for Civilian Service

Dr. Alan Brimfield
Cristin Rothwell
Gregory Smith

Achievement Medal for Civilian Service

Megan E. Lyman

30 Years of Civilian Service

Tracey Hamilton

25 Years of Civilian Service

Michael Massarelli
Steven Otto

20 Years of Civilian Service

Betty Jean Benton
John Hengemihle

10 Years of Civilian Service

Douglas Nichols
Theresa Pardon
Albert Ruff

Promotions

January

Spc. Darius Oden Daffin
Lt. Col. Lee Jarrod Lefkowitz
Pfc. Brian Jeffrey Meyer
Lt. Col. Jason Adam Nelson

WRAIR

Promotions

January

Spc. Laura Michelle Bean
Sgt. Antonio Charles Frazier
Lt. Col. Jeffrey L. Thomas
Capt. Liang Nmn Zhang

February

Pfc. Erikka Zalina Johnson

March

Sgt. Randall Scott Mills
Spc. Ashlie Marie Strickland
Maj. Brett Edward Swierczewski

USAARL

December 2011

Army Achievement Medal

Spc. Jinyong Bae
Spc. Stanslaus Simiyu

Certificate of Achievement

Pfc. Monica Manalo

Achievement Medal for Civilian Service

Debbie Cain
Jane Heath
Robyn Maderra

Mary Mayo
Janet Pray

Certificate of Appreciation

Matt Cox

February

Certificate of Achievement

Sgt. Kareem Clayborne

Achievement Medal for Civilian Service

Jill Emerson
Stephanie Moon

10 Years of Civilian Service

Tony Bloom

Promotions

January

Spc. Josue Sosa

March

Maj. Jonathan P. Deeter II

USAMRMC

January

Army Commendation Medal

Spc. Tymara B. Williams

Meritorious Service Medal

Master Sgt. Mark A. Reynolds

Promotions

February

Lt. Col. Gina Elena Adam
Lt. Col. Raymond Vazquez

USAISR

December 2011

Meritorious Service Medal

Capt. Laura L. Mcghee

January

Meritorious Service Medal

Col. Debra A. Spencer

Promotions

January

Spc. Kyle Hunter Smith

February

Spc. Michael Paul Longfoot

USAMRIID

January

Meritorious Service Medal

Lt. Col. Christine A. Ege
Lt. Col. Nancy Twenhafel
Maj. Tonia D. Ashton
Sgt. 1st Class Sophia Hamilton-Moxley

Promotions

January

Sgt. Deshandra Annette Henry
Lt. Col. Shelley Caroline Jorgensen
Pfc. Justine Melgoza Lopez
Spc. Ashlei K. Molina
Sgt. Elyse Christine Troxell

February

Sgt. 1st Class Khalilah Najwa Joyner
Sgt. 1st Class Jesse Alex Kaplan

March

Sgt. Kyle Edward Trim